US006324178B1

(12) **United States Patent**
Lo et al.

(10) **Patent No.:** **US 6,324,178 B1**
(45) **Date of Patent:** **Nov. 27, 2001**

(54) **METHOD FOR EFFICIENT DATA TRANSFERS BETWEEN DOMAINS OF DIFFERING DATA FORMATS**

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(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: 09/085,135

(22) Filed: **May 26, 1998**

(51) Int. Cl.^{7} **G06F 15/167**
(52) U.S. Cl. **370/392**; 370/466; 370/467; 370/475
(58) Field of Search 370/392, 428, 370/466, 470, 471, 472, 473, 474, 475, 476, 467; 710/52, 56, 22, 26, 27; 709/213, 214, 217

(56) **References Cited**

U.S. PATENT DOCUMENTS

5,796,742	*	8/1998	Klotzbach et al.	370/466
5,815,679	*	9/1998	Hoffman et al.	710/8
5,898,687	*	4/1999	Harriman et al.	370/392
5,949,785	*	9/1999	Beasley	370/398
6,111,880	*	8/2000	Rusu et al.	370/466
6,219,697	*	4/2001	Lawande et al.	709/221

OTHER PUBLICATIONS

Johansson, IP over IEEE 1394, IETF, Internet–Draft, pp. 1–17, Aug. 1997.*

Hoe et al, StarT–Jr: A Parallel System from Commodity Technology, MIT, pp. 1–17, Oct. 1, 1996.*

* cited by examiner

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(57) **ABSTRACT**

A method for efficient data transfers between domains of differing data formats. In one exemplary implementation, data transfer is performed with respect to an IEEE 1394 communication domain and an Ethernet communication domain. The novel data transfer method advantageously eliminates the need to copy the data payload section of a received data packet from one memory region to another memory region within a bridge device coupled between first and second communication domains. Specifically, the header, data payload and trailer sections of a received data packet (of a first communication domain format) are copied into a first portion of memory within the bridge device. The present invention then assembles a new data packet by constructing a new header of a second communication domain and appending a pointer to the new header that points to the data payload location within the first portion of memory. The header includes a destination address obtained from the data payload location and a source address of the bridge device. The new packet is of the second communication domain. The bridge device then transmits the new header section to the second communication domain and forwards the data payload therewith using the pointer as a reference. Domain interface controller circuits then add the new trailer, as required, to the new packet. By passing a pointer to the data payload, the present invention eliminates the need to copy the data payload from one region of memory to another during the transfer operation.

20 Claims, 13 Drawing Sheets